EDITORIAL ARTICLES.

SOME RECENT CONTRIBUTIONS TO THE SURGERY OF THE STOMACH.

SCHRAMM,[1] KRIEGE,[2] KAENSCHE,[3] ROSENHEIM,[4] VON NOORDEN,[5] have all published interesting papers on this subject.

I. Von Noorden says that gastrostomy for œsophageal stenosis is only justified where the surgical procedure offers the patient an improvement in condition, and the possibility of relief from the symptoms due to the progressing starvation. He prefers Witzel's[6] operation, in which he is sustained by Mikulicz, who asserts that the superiority of this method has been demonstrated in all the cases he has operated upon lately.

The operation is briefly described. An incision is made under and parallel to the costal arch, and the anterior stomach wall is drawn up into the wound. Two oblique longitudinal folds, running upward from left to right, of the stomach walls are raised and drawn together over a rubber drainage tube of the thickness of a lead pencil by a series of Lembert sutures. The lower end of this tube should previously be inserted into the stomach through a narrow opening made into the posterior portion of this channel. Further suturing may be employed to bring together more layers of the stomach wall. The second step of the operation consists in attaching the stomach to the abdominal walls. The drainage tube is conducted out of the edge of the abdominal incision nearest to the median line, and the rest of

[1] Wiener Medizinische Presse, November 20, 1892.

[2] Berliner Klinische Wochenschrift, December 5 and 12, 1892.

[3] Deutsche Medicinische Wochenschrift, December 8, 1892.

[4] Deutsche Medicinische Wochenschrift, December 8, 1892.

[5] Berliner Klinische Wochenschrift, January 2, 1893.

[6] Centralblatt für Chirurgie, 1891, No. 32.

the abdominal incision is closed. The transversalis and rectus muscles should be split parallel to their fibres, and the drainage tube drawn through these openings, so that when the muscles reunite they control the opening into the stomach.

It is, therefore, evident that the new alimentary canal does not lead into the stomach directly in a straight line, but runs obliquely; in order to escape, the contents of the stomach must pass through this indirect canal, rendering regurgitation almost impossible.

Mikulicz has operated in this way five times with excellent results. The first case was a man, fifty-two years of age, who had a stricture of the œsophagus, 32 cm. below the teeth. At the operation a portion of the anterior stomach wall, measuring 15 cm. in length and 10 cm. in breadth, was drawn out and held by an assistant's fingers at each end of the abdominal incision, and the region was surrounded with aseptic compresses, that there might be no danger of infecting the rest of the peritonæum during the manipulations of the stomach. About 6 cm. of a rubber drain was then sewed into the raised stomach fold with simple peritoneal muscular layer sutures of fine silk, until the drain was well imbedded in the stomach wall. A second, and in some places even a third, row of stitches were applied. A very small incision was then made into the stomach at the lateral end of this canal, and the end of the drain was inserted through the opening. None of the contents of the stomach escaped. About 3 cm. of the tube protruded into the viscus. The tube was then sutured to the stomach wall with catgut and surrounded as in the canal. The superior surface of this newly-formed canal was then sutured to the parietal peritonæum by several silk sutures, so as to insure its attachment to the abdominal wall and render the field of operation permanently extra-peritoneal.

The stomach was then distended, by feeding through the tube, with milk and wine, and the patency of the line of suture was then clearly demonstrated, as none of the fluid escaped. The abdominal wall was carefully closed with "etage" sutures, the free end of the tube being left out at the end of the incision nearest to the median line.

This open end of the tube was compressed by means of a spring forceps. The patient recovered strength rapidly, and eighteen days later the tube was withdrawn and left out for a time, but there was no escape of the contents of the stomach along the fistula. A permanent tube, however, is considered safer for patients to use themselves than to allow them to insert it before every meal.

The second case was a woman fifty-eight years of age who had had symptoms of stricture of the œsophagus for five months. The operation was in every way similar to the former case, and she was well in two weeks. The third case was also a woman fifty-six years old, in whom a high tracheotomy had to be performed in consequence of a paralysis of the posterior crico-arytenoid muscles of both sides. A sound could not be passed through the œsophagus. The only difference in the operation in this case was that the tube was fixed in the stomach before forming the canal. Her recovery was quite as good as the other two cases. The fourth patient was only twenty-seven years of age. In this case an oblique incision not parallel to the costal arch was made. On opening the stomach the region of the wound was inundated by the stomach contents. There was one place at the lower margin of the wound where it did not seem advisable to stitch the peritoneal layers together, and this was packed with iodoform gauze. The rest of the wound was treated in the usual way. The œsophageal stricture was finally overcome to such an extent in this case that the gastric fistula was closed at the end of two months.

The fifth case was in a wretched condition when the operation was performed; the patient was a man sixty years old, whose trouble dated back a year. The stomach was empty and much contracted. The progress of the case was decidedly satisfactory.

In these cases a tube suggested by Mikulicz may be employed. This consists of a glass tube 4–6 cm. long, which is expanded into a small, round disc at the junction of the upper and middle thirds. A second tube is then fused within this one in such a way that nothing can get between them. When one end of this tube is inserted

into the fistula the disc can be pressed firmly against the orifice, and held there by adhesive plaster. The free end of the tube can be closed with a rubber cork.

This tube may remain in place eight days and longer, does not allow anything to pass alongside of and does not irritate the tissues.

Van Noorden believes that this operation should be performed as soon as fluid and soft food can no longer pass without obstruction, or as soon as it is evident that nutrition is not being fully sustained.

II. Kriege reports a case of gastric ulcer with perforation cured by operation. So far as his investigations go this is the only case of perforation following an ulcer of the stomach in which this result has been obtained. His patient was a man forty-one years of age who had had gastric trouble for twenty years with hæmatamesis. Sudden symptoms intervened, which led to the diagnosis of a perforation of a gastric or duodenal ulcer. An incision was made in the linea alba, from the xiphoid process to the umbilicus, and when the peritonæum was opened there was an outrush of odorless gas. The stomach contents were found in the peritoneal cavity, especially on the left side, but there was scarcely any injection of the peritonæum. At first no perforation could be discovered, but finally, after the incision had been carried well to the left, at right angles to the first, through the rectus muscle, exposing the whole stomach, a perforation was found three cm. from the cardiac opening nearer to the fundus than to the beginning of the small curvature. The opening was about the size of a pea. The suturing was very difficult, but was finally successful. The blood and contents of the stomach were then removed from the peritoneal cavity by means of sterilized compresses, and the abdominal wound was closed except at the ends of the incisions, where an iodoform gauze tampon was inserted. The patient was allowed absolutely no food per os, not even pieces of ice. Thirteen days after the operation the first food was allowed to enter the stomach, and at the end of three weeks the patient was permitted to get out of bed. About five weeks after the operation an empyema of the left side was discovered,

and a piece of the tenth rib was resected, allowing the discharge of about one-half litre of ill-smelling pus. Three and a half months later the patient had fully recovered his strength.

Another case of the same kind was operated upon, an incision being made from the xiphoid process down to a point one hand's breadth above the symphysis. Some peritonitis was present in this case, accompanied with so much meteorism that it was necessary to puncture the intestine in five places. The stomach also had to be punctured. All these openings were closed with silk sutures. The anterior wall of the stomach was agglutinated to the liver, and when these adhesions were broken up fluid ran out in considerable quantities, but no perforation could be made out. When pressure was made on the fundus, stomach contents stained with bile came from the upper part of the cavity, and a transverse incision was made through the abdominal walls to the left, when a perforation was discovered, the size of a five-cent piece, near the cardiac orifice. About one-half litre of gastric contents were dipped out and the hole closed with three silk sutures and five "etage" sutures. The abdominal cavity was cleansed, a pus focus in the pelvis being evacuated, and the abdominal wound was closed. The patient was much collapsed at the end of the operation. Eight days later, when everything seemed to be progressing favorably, symptoms of hæmorrhage set in, and she died ten days after the operation. At the autopsy an abscess was found undermining the whole abdominal wound. There was only a localized peritonitis, but a loop of intestine was found which had penetrated a fissure accidentally made in the mesentery at the time of the operation. The intestine was swollen above this point, and a perforation was found in the duodenum near the head of the pancreas. This operation was not undertaken until two days and nine hours after the original perforation occurred.

A summary of six cases of ulcer of the stomach and two of the bowels is given. Of these all died except the one reported by Kriege.

He concludes that the operation is justified and necessary when

the diagnosis can be determined early enough, and skilled surgical aid is at hand. Operation should be performed as soon as possible. It is important to remember the localities where perforation is most liable to occur. Eighty-five per cent. of the ulcers are in the anterior wall of the stomach, and 40 per cent. of those in the vicinity of the cardiac orifice penetrate the stomach, while on the posterior wall only 2 per cent. cause this trouble. If the place is readily accessible it is best to cut out the entire ulcer, or at least its borders, although in difficult cases suture alone will suffice.

Nutrition should be maintained by enemata as long as possible, and even water and ice per os should be avoided. A careful examination should be made after closing the perforation to ascertain whether an encapsulated intra-peritoneal abscess had formed, and the left pleural cavity should also be watched. The results of this treatment will be better in the future than they are at present. The intestinal contents are much more dangerous when they escape into the peritoneal cavity than the contents of the stomach.

III. Schramm remarks upon the surprising number of cases of gastric surgery that have been reported within the past few years, one hundred and thirty cases of resection of the pylorus alone having been reported within the past five years.

The very high mortality following the earlier operations, 70 per cent., caused a more careful analysis, and it was ascertained that in cases where neoplasms had become adherent to the neighboring parts, such as the liver, pancreas and colon, the mortality was 97 per cent., but in those cases which were still only slightly adherent it only amounted to 60 per cent., while where no adhesions existed it was as low as 50 per cent. The operation was therefore contraindicated in the first class of cases, gastroenterostomy offering the best solution for the problem. He reports four cases of cancer of the stomach upon which he had operated. The first, in 1886, remained well for a year, when a recurrence was observed, but the patient was then lost sight of and the subsequent history is not known. The second case was one of resection of the pylorus, and was discharged from the

hospital eleven days after the operation. This patient remained well at the time of the report, eighteen months later. The tumor was found to be an adeno-carcinoma. The third case was firmly adherent to the liver and colon, and gastroenterostomy was performed, and three weeks after the operation the patient was in a very satisfactory condition. The fourth case was also one of gastroenterostomy, in which the report is that the patient's condition was tolerable and remained so for three months.

Cancer of the stomach should be subjected to early operation. Physicians should refer these cases to the surgeon as soon as the diagnosis of cancer of the stomach is made out, and the patient should be informed that an immediate operation is the only relief he can obtain. Where this is done the mortality following resection of the pylorus will be decidedly reduced. The sutures must be applied very accurately, their parting means the death of the patient. In Billroth's clinic a collection of the causes of death following this operation shows that out of twenty-one cases seventeen died in consequence of the giving way of the stitch. Schramm considers three-layer sutures, strengthened by a few Lembert sutures at the place where the two lines of sutures meet, the best method of proceeding.

If the stomach has been well cleaned and slightly compressed by a four-headed compress placed underneath, the finger pressure of a skilled assistant suffices to prevent the intestinal contents flowing out. This obviates the necessity of making an opening in the mesentery for the passage of a compress.

Resection of the pylorus should not be employed in cases of advanced carcinoma of the stomach, especially when there is a large tumor adherent to other organs. Whenever it is impossible to determine beforehand whether or not resection of the pylorus is possible, and whenever it proves impossible after opening the abdominal cavity, gastroenterostomy should be performed, even though there should not be any stenosis of the pylorus, so as to save the patient the necessity of another operation. In cases, however, where the existence of adhesions, indicating that the resection of the

pylorus is contraindicated can be determined before opening the abdomen, it is advisable not to perform gastroenterostomy, unless there is a very marked stenosis.

The author also reports one case of gastrostomy for carcinoma œsophagi. The patient had not been able to swallow a drop of liquid for two weeks. The stricture was 30 cm. from the teeth, and impassable to any instrument. An opening, ½ cm. in size, was made into the stomach after it had been attached to the abdominal wall, and a drainage tube was tightly fitted into it. The patient was greatly collapsed before this stage of the operation, and a few tablespoonsful of wine was poured into the stomach, when he began to improve at once. He was then fed with wine and strong broth in small quantities every two hours. At the end of twelve days the wound was healed, but two days later he developed a pneumonia, from which he died eighteen days after the operation.

He advises in these cases of œsophageal cancer that operation should be performed as soon as the swallowing of liquids becomes troublesome, although dilatation will often improve a stricture materially. In many cases, however, the sound cannot be employed, and operation is the only recourse.

Even in very advanced stages the relief to the patient is so great that the operation is fully justified, and in some of these advanced cases a considerable prolongation of life has been obtained. The tendency of the gastric fistula is to grow larger, causing leakage; no efficient means have as yet been devised for preventing this.

IV. Kaensche, at the request of Mikulicz, made a thorough investigation regarding the influence of resection of the pylorus upon the function of the stomach, the general condition of the patient, and the control of the subjective symptoms, in four cases operated upon by Mikulicz.

One of these cases was a young girl who had a round ulcer of the stomach; the others had stenosis from carcinoma of the pylorus. In the first case the ulcer was resected, in two resection of the pylorus was performed, and the fourth case was one of gastroenterostomy.

The condition of the stomach with regard to its functional activity, secretion, motion and absorbability, was carefully determined before and after operation.

The first case was a man forty-one years of age with a carcinoma of the pylorus. On cleansing the stomach of all its contents, considerable quantities of decomposed acid food were evacuated. He was given some test food, which was removed every two and one-half hours to examine its condition. The masses obtained at these examinations were hardly changed by the action of the stomach secretions. The gastric juice, when it was filtered out, was strongly acid, but no free hydrochloric acid could be obtained. There was a large amount of lactic acid. Experimental digestion yielded no results. The gastric juice was incapable of digesting albumen, either when employed by itself or upon the addition of hydrochloric acid, even after twelve hours. Under the microscope there were found undigested muscular fibre, in which the transverse striation was distinctly seen, numerous starch grains and many saccharomyces and sarcinæ. Another test meal was given the next day, and some hours later it was removed almost unchanged. The absorbing capacity of the gastric mucous membrane appeared to be intact, as iodine was found in the saliva within thirteen minutes. After the operation the nutrition rapidly improved. In the second case, a woman, forty-two years of age, there had been stomach trouble for two and a half years, and all the symptoms of cancer of the stomach. Lavage brought up large quantities of decomposed food, and the last meal which was withdrawn from the stomach, after three hours, gave an acid reaction. No free hydrochloric acid could be found, but there was an abundance of lactic acid. The microscopic examination was similar to the first case. The gastric juice, when it had been filtered and not diluted, was incapable of digesting albumen in twelve hours, but when hydrochloric acid was added this power returned. There was scarcely any motor power left in the stomach. Six and a half hours after a test meal there was still considerable food left in the stomach. The improvement in the general condition following the resection of the

pylorus was decided. In the fourth case the gastric juice was only feebly acid, and contained no free hydrochloric acid. Albumen remained undigested even after the addition of hydrochloric acid. The muscular force of the stomach was much diminished. Gastro-enterostomy was performed in this case, and there was a decided improvement.

The examination in these three cases showed that the secretory action of the stomach was not influenced by this operation, nor was there any change in the digestion or the power of absorption of the stomach, but the muscular power was considerably increased, and the subjective symptoms were completely overcome. The operation also had a markedly beneficial influence on the strength and weight of the patients.

The fourth case was one of ulcer of the stomach, and the gastric juice was acid, with an abundance of hydrochloric acid and apparently no lactic acid. The digestion of albumen was complete. Under the microscope sarcinæ were present, but no saccharomyces or bacteria. A test meal was almost completely digested at the end of six hours. In this case an attempt to remove the remains of a test meal on the twenty-eighth day after the operation caused violent vomiting, slight hæmorrhage and had to be abandoned. She improved rapidly.

V. Rosenheim also discusses the gastric functions after resection of a carcinomatous pylorus. He presented a case upon which he had resected the pylorus for this condition one year and a half before. Her condition was excellent; she had no gastric trouble, had a good appetite and her bowels were regular. Repeated examinations revealed the fact that no bile entered the stomach, and he considered that the pyloric functions were performed by the remaining muscular tissue. Examination during the different stages of digestion proved that that process was absolutely normal. The stomach contained, one hour after taking 300 grams of tea and 60 of white bread, about 70 grams of food paste of neutral reaction which appeared as though it had simply been chewed and then expectorated. The stomach was

empty when it was washed out two and a half hours after a test breakfast, so that the muscular power of this organ had returned. It took the same time to digest and force this meal into the intestine as it did in a normal stomach.

SAMUEL LLOYD.

HAWKINS ON TUBERCULAR PERITONITIS.[1]

THE term "tubercular peritonitis" is used in its familiar sense, including those cases only in which the peritoneal affection predominates, though deposits are commonly present elsewhere. The impression, gathered from older writers, prevails that recovery under medical treatment is very rare, and the opinion has been growing in strength that the mortality may be materially diminished by operative interference.

König gives an opinion, founded on 131 cases, that by laparotomy 75 per cent. are much benefited and 25 per cent. completely cured.

The same idea finds expression in the valuable paper of Osler, who goes so far as to place "abdominal section for tubercular peritonitis among the triumphs of recent surgery."

In order to ascertain the results of medical treatment alone, 100 consecutive cases were taken from hospital practice (St. Thomas') and critically examined. It was found that all ages were liable to the disease, the range in the series being from 1 to 60 years. Two-thirds of the cases occurred between the ages of 5 and 30 years; 24 of the 100 cases had a strong family history of phthisis.

The Mortality.—Forty died and 59 recovered. Of the 59 non-fatal cases there was a tubercular family history in 15 per cent., while in the 40 fatal cases there was a family history in 37 per cent. An analysis of the 59 cases of apparent cure shows

[1] Tubercular Peritonitis: Its Various Forms, Their Surgical Treatment and Comparative Curability. By H. P. Hawkins, M.B., M.R.C.P., London. St. Thomas Hospital Reports, Vol. XX (1892).